

# NASA TECH BRIEF



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## Hot-Wire Detector for Chemically Active Materials Used in Gas Chromatography

### The problem:

To design a detector for gas chromatographic analysis of chemically active materials. Conventional hot-filament detectors have been used in gas chromatography only for analysis of gases or vapors which do not react chemically with the detector filament.

### The solution:

Use a hot-filament detector that reacts chemically with the effluent vapors in the gas chromatographic apparatus to change the electrical resistance of the filament as a function of the effluent composition.

### How it's done:

The filament is made of titanium or zirconium for analysis of vapors that are evolved at high temperatures. Other reactive metals may be used for analysis of vapors at lower temperatures.

Before the sample to be analyzed is introduced into the chromatographic apparatus, an inert carrier gas (e.g., helium) is passed at a controlled rate over the filament which is heated to the desired operating temperature by a constant-current source. When equilibrium is established, the electrical resistance of the filament is measured with a standard circuit. The sample is then introduced into the ap-

paratus and the resultant resistance change of the filament with time is measured and plotted on a chromatogram. The quantity of each component in the sample is determined (as in conventional gas chromatography) by measuring peak heights on the chromatogram and multiplying by calibration factors.

### Notes:

1. Because of the changes produced by chemical action on the filament, the system should be frequently calibrated.
2. Inquiries concerning this invention may be directed to:

Technology Utilization Officer  
Manned Spacecraft Center  
Houston, Texas, 77001  
Reference: B66-10139

### Patent status:

Inquiries about obtaining rights for the commercial use of this invention may be made to NASA, Code GP, Washington, D.C., 20546.

Source: North American Aviation, Inc.  
under contract to  
Manned Spacecraft Center  
(MSC-269)

Category 03